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## INFORMATION DISCLOSURE STATEMENT BY APPLICANT

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Sheet

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of

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Attorney Docket Number

**C mplete if Known**

Application Number

09/887.997

Filing Date

**June 22, 2001**

**First Named Inventor**

## Quake

**Group Art Unit**

1725

Examiner Name

Unassigned

Attorney Docket Number

20174C-004900US

## U.S. PATENT DOCUMENTS

Examiner Initials *	Cite No. <sup>1</sup>	U.S. Patent Document		Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD-YYYY	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number	Kind Code <sup>2</sup> (if known)			
A	AA	2001/0027745	A1	Weigl et al.	10-11-2001	
	AB	6,296,673	B1	Santarsiero et al.	10-02-2001	
	AC	6,174,365	B1	Sanjoh	01-16-2001	
	AD	6,123,769		Sanjoh	09-26-2000	
	AE	6,007,309		Hartley	12-28-1999	
	AF	5,876,187		Afromowitz et al.	03-02-1999	
	AG	5,836,750		Cabuz	11-17-1998	
	AH	5,759,014		Van Lintel	06-02-1998	
	AI	5,705,018		Hartley	01-06-1998	
	AJ	5,659,171		Young et al.	08-19-1997	
	AK	5,529,465		Zengerle et al.	06-25-1996	
	AL	5,400,741		DeTitta et al.	03-28-1995	
	AM	5,376,252		Ekstrom et al.	12-27-1994	
	AN	5,375,979		Trah	12-27-1994	
	AO	5,336,062		Richter	08-09-1994	
	AP	5,265,327		Faris et al.	11-30-1993	
	AQ	5,259,737		Kamisuki et al.	11-09-1993	
	AR	5,224,843		Van Lintel	07-06-1993	
	AS	5,171,132		Miyazaki et al.	12-15-1992	
	47	AT	5,126,115		Fujita et al.	06-30-1992
AU		5,096,388		Weinberg	03-17-1992	
AV		5,085,562		Van Lintel	02-04-1992	
AW		4,153,855		Feingold	05-08-1979	
AX		4,119,368		Yamazaki	10-10-1978	

**Examiner  
Signature**

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**Complete if Known**

<b>Application Number</b>	09/887,997
<b>Filing Date</b>	June 22, 2001
<b>First Named Inventor</b>	Quake
<b>Group Art Unit</b>	1725
<b>Examiner Name</b>	Unassigned
<b>Attorney Docket Number</b>	20174C-004900US

(use as many sheets as necessary)

Sheet	2	of	7
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Attorney Docket Number	20174C-004900US
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Sheet 3 of 7

## Complete if Known

Application Number	09/887,997
Filing Date	June 22, 2001
First Named Inventor	Quake
Group Art Unit	1725
Examiner Name	Unassigned
Attorney Docket Number	20174C-004900US

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## OTHER PRIOR ART -- NON PATENT LITERATURE DOCUMENTS

Examiner Initials *	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T <sup>2</sup>
	BK	Ahn et al., "Fluid Micropumps Based on Rotary Magnetic Actuators," <u>Proceedings of 1995 IEEE Micro Electro Mechanical Systems Workshop (MEMS '95)</u> , held in Amsterdam, Netherlands on 1/29-2/2/95, pgs. 408-412 (1995).	
	BL	Benard et al., "A Titanium-Nickel Shape-Memory Alloy Actuated Micropump," <u>Proceedings of Transducers '97</u> , 1997 International Conference on Solid-State Sensors and Actuators, held in Chicago, IL, 6/16-19/1997, 1:361-364 (1997).	
	BM	Brechtel et al., "Control of the electroosmotic flow by metal-salt-containing buffers," <u>J Chromatography A</u> , 716:97-105 (1995).	
	BN	Bryzek et al., "Micromachines on the march," <u>8045 IEEE Spectrum</u> , 31(5):20-31 (1994). XP 000456261	
	BO	Buchaillot et al., "Silicon Nitride Thin Films Young's Modulus Determination by an Optical Non-Destructive Method," <u>Jpn. J. Appl. Phys.</u> , 36 Pt. 2(6B):L794-L797 (1997).	
	BP	Chiu et al., "Patterned deposition of cells and proteins onto surfaces by using three-dimensional microfluidic systems", <u>PNAS</u> , 97(6):2408-2413 (2000).	
	BQ	Chou et al., "A microfabricated device for sizing and sorting DNA molecules," <u>PNAS</u> , 96:11-13 (1999).	
	BR	Delamarche et al., "Patterned Delivery of Immunoglobulins to Surfaces Using Microfluidic Networks," <u>Science</u> , 276:779-781 (1997).	
	BS	Duffy et al., "Rapid Prototyping of Microfluidic Systems in Poly(dimethylsiloxane)", <u>Analytical Chemistry</u> , 70(23):4974-4984 (1998).	
	BT	Duffy et al., "Rapid prototyping of microfluidic switches in poly(dimethyl siloxane) and their actuation by electro-osmotic flow," <u>J. Micromech. Microeng.</u> , 9:211-217 (1999).	
	BU	Duffy et al., "Patterning Electroluminescence Materials with Feature Sizes as Small as 5 µm Using Elastomeric Membranes as Masks for Dry Lift-Off," <u>Adv. Mater.</u> , 11(7):546-552 (1999). XP-000849014	
	BV	Effenhauser et al., "Integrated Capillary Electrophoresis on Flexible Silicone Microdevices: Analysis of DNA Restriction Fragments and Detection of Single DNA Molecules on Microchips," <u>Anal. Chem.</u> , 69(17):3451-3457 (1997).	
	BW	Effenhauser et al., "Integrated chip-based capillary electrophoresis," <u>Electrophoresis</u> , 18:2203-2213 (1997).	

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# INFORMATION DISCLOSURE STATEMENT BY APPLICANT

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Sheet

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## Complete If Known

Application Number	09/887,997
Filing Dat	June 22, 2001
First Named Inventor	Quake
Group Art Unit	1725
Examiner Name	Unassigned
Attorney Docket Number	20174C-004900US

## OTHER PRIOR ART -- NON PATENT LITERATURE DOCUMENTS

Examiner Initials *	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T <sup>2</sup>
	BX	Fahrenberg et al., "A microvalve system fabricated by thermoplastic molding," <u>J. Micromech. Microeng.</u> , 5:169-171 (1995).	
	BY	Fu et al., "A microfabricated fluorescence-activated cell sorter," <u>Nature Biotechnology</u> , 17:1109-1111 (1999).	
	BZ	Gass et al., "Integrated flow-regulated silicon micropump," <u>Sensors and Actuators A</u> , 43335-338 (1994).	
	CA	Gerlach, T., "Pumping Gases by a Silicon Micro Pump with Dynamic Passive Valves," <u>Proceedings of Transducers '97</u> , 1997 International Conference on Solid-State Sensors and Actuators, held in Chicago, IL, 6/16-19/1997, 1:357-360 (1997).	
	CB	Goll et al., "Microvalves with bistable buckled polymer diaphragms," <u>J. Micromech. Microeng.</u> , 6:77-79 (1996).	
	CC	Graveson et al., "Microfluidics—a review," <u>J. Micromech. Microeng.</u> , 3:168-182 (1993).	
	CD	Harrison et al., "Micromachining a Miniaturized Capillary Electrophoresis-Based Chemical Analysis System on a Chip," <u>Science</u> , 261:895-897 (1993).	
	CE	Hornbeck et al., "Bistable Deformable Mirror Device," <u>Spatial Light Modulators and Applications 1988 Technical Digest Series, Volume 8</u> , Postconference Edition, Summaries of papers presented at the Spatial Light Modulators and Applications Topical Meeting, June 15-17, 1988, Optical Society of America, pgs. 107-110.	
	CF	Hosokawa et al., "Handling of Pico-liter Liquid Samples in a Poly(dimethylsiloxane)-Based Microfluidic Device," <u>Anal. Chem.</u> , 71(20):4781-4785 (1999).	
	CG	Ikuta et al., "Three dimensional micro integrated fluid systems (MIFS) fabricated by stereo lithography," <u>IEEE Kyushu Institute of Technology</u> , pgs. 1-6 (1994).	
	CH	Jacobson et al., "High-speed separations on a microchip," <u>Anal. Chem.</u> , 66(7):1114-1118 (1994).	
	CI	Jacobson et al., "Microfluidic Devices for Electrokinetically Driven Parallel and Serial Mixing," <u>Anal. Chem.</u> , 71(20):4455-4459 (1999).	
	CJ	Jerman, H., "Electrically-Activated, Normally-Closed Diaphragm Valves," <u>Proceedings of Transducers '91</u> , 1991 International Conference on Solid-State Sensors and Actuators, pages 1045-1048 (1991).	

Examiner  
Signature

*[Signature]*

Date

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*[Signature]*

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## INFORMATION DISCLOSURE STATEMENT BY APPLICANT

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Sheet 5 of 7

### Complete if Known

Application Number	09/887,997
Filing Date	June 22, 2001
First Named Inventor	Quake
Group Art Unit	1725
Examiner Name	Unassigned
Attorney Docket Number	20174C-004900US

### OTHER PRIOR ART -- NON PATENT LITERATURE DOCUMENTS

Examiner Initials *	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T <sup>2</sup>
	CK	Jung et al., "Chemical and Physical Interactions at Metal/Self-Assembled Organic Monolayer Interfaces," <u>Critical Reviews in Solid State and Material Sciences</u> , 19(1):2-10 (1994).	
	CL	Kenis et al., "Microfabrication Inside Capillaries Using Multiphase Laminar Flow Patterning," <u>Science</u> , 285:83-85 (1999).	
	CM	Kopp et al., "Chemical Amplification: Continuous-Flow PCR on a Chip", <u>Science</u> , 280:1046-1048 (1998).	
	CN	Kuhn et al., "Silicon Charge Electrode Array for Ink Jet Printing", <u>IEEE Transactions on Electron Devices</u> , ED-25(10):1257-1260 (1978).	
	CO	Lin et al., "Free-Space Micromachined Optical Switches for Optical Networking," <u>IEEE J. Selected Topics in Quantum Electronics</u> , 5(1):4-9 (1999).	
	CP	Lötters et al., "The mechanical properties of the rubber elastic polymer polydimethylsiloxane for sensor applications," <u>J. Micromech. Microeng.</u> , 7:145-147 (1997).	
	CQ	Lucy et al., "Characterization of the Cationic Surfactant Induced Reversal of Electroosmotic Flow in Capillary Electrophoresis," <u>Anal. Chem.</u> , 68:300-305 (1996).	
	CR	Maluf, N., <u>An Introduction to Microelectromechanical Systems Engineering</u> , Artech House Publishers, Boston London pages 42-45.	
	CS	Markx et al. "Applications of dielectrophoresis in biotechnology," <u>Tibtech</u> , 15:426-432 (1997).	
	CT	Muller et al., "Surface-Micromachined Microoptical Elements and Systems," <u>Proceedings of IEEE</u> , 86(8):1705-1720 (1998).	
	CU	Olsson et al., "Simulation Studies of Diffuser and Nozzle Elements for Valve-less Micropumps," <u>Proceedings of Transducers '97</u> , 1997 International Conference on Solid-State Sensors and Actuators, held in Chicago, IL, 6/16-19/1997, 2:1039-1042 (1997).	
	CV	Qin et al., "Elastomeric Light Valves**", <u>Adv. Mater.</u> , 9(5):407-410 (1997). XP-000683891	
	CW	Qin et al., "Photolithography with transparent reflective photomasks," <u>J. Vac. Sci. Technology</u> , 16(1):98-103 (1998).	
	CX	Rapp. R., "LIGA micropump for gases and liquids," <u>Sensors and Actuators A</u> , 40:57-61 (1994).	

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Signature

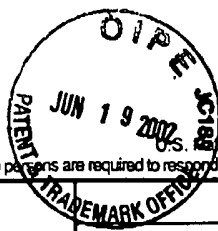
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Sheet

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**Complete if Known**

Application Number	09/887,997
Filing Date	June 22, 2001
First Named Inventor	Quake
Group Art Unit	1725
Examiner Name	Unassigned
Attorney Docket Number	20174C-004900US

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## **OTHER PRIOR ART -- NON PATENT LITERATURE DOCUMENTS**

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	CY	Roylance et al., "A Batch-Fabricated Silicon Accelerometer", <u>IEEE Transactions on Electron Devices</u> , ED-26(12):1911-1917 (1979).	
	CZ	Schasfoort et al., "Field-Effect Flow Control for Microfabricated Fluidic Networks," <u>Science</u> , 286:942-945 (1999).	
	DA	Schuessler et al., "Fabrication of glassy carbon microstructures by soft lithography," <u>Sensors and Actuators</u> , 72(2):125-139 (1999).	
	DB	Shoji, S., "Fluids for Sensor Systems", <u>Topics in Current Chemistry</u> , 194:162-188 Springer Verlag Berlin Heidelberg (1998).	
	DC	Shoji et al., "Smallest Dead Volume Microvalves for Integrated Chemical Analyzing Systems," <u>Proceedings of Transducers '91</u> , 1991 International Conference on Solid-State Sensors and Actuators, pages 1052-1055 (1991).	
	DD	Smits, J.G., "Piezoelectric Micropump with Three Valves Working Peristaltically", <u>Sensors and Actuators</u> , A21-A23:203-206 (1990).	
	DE	Sohn et al., "Capacitance cytometry: Measuring biological cells one by one," <u>PNAS</u> , 97(20):10687-10690 (2000).	
	DF	Tufte et al., "Silicon Diffused-Element Piezoresistive Diaphragms," <u>J. Appl. Phys.</u> , 33(11):3322-3327 (1962).	
	DG	Van der Pol et al., "Micro Liquid Handling Devices - A Review", <u>Micro Systems Technologies</u> , 90:799-805 (1990).	
	DH	Vieider et al., "A Pneumatically Actuated Micro Valve with a Silicone Rubber Membrane for Integration with Fluid-Handling Systems," <u>Proceedings of Transducers '95</u> , the 8th International Conference on Solid-State Sensors and Actuators and Eurosensors IX, held in Stockholm, Sweden on 6/25-29/95, 2:284-286 (1995).	
	DI	Washizu et al., "Molecular Dielectrophoresis of Biopolymers," <u>IEEE Transactions on Industry Applications</u> , 30(4):835-843 (1994).	
	DJ	Xia et al., "Complex Optical Surfaces Formed by Replica Molding Against Elastomeric Masters," <u>Science</u> , 273:347-349 (1996).	
	DK	Xia et al., "Soft Lithography," <u>Angew. Chem. Int. Ed.</u> 37:551-575 (1998).	
	DL	Xia et al., "Micromolding of Polymers in Capillaries: Applications in Microfabrication," <u>Chemistry of Materials</u> , 8(7):1558-1567 (1996).	

Examiner Signature

*[Handwritten Signature]*

Date

Considered

*4/16/04*

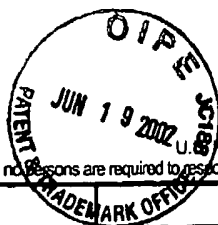
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Sheet 7 of 7

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	DM	Xia et al., "Micromolding in Capillaries: Applications in Material Science," <u>J. American Chemical Society</u> , 118:5722-5731 (1996).	
	DN	Yang et al., "A Mem Thermopneumatic Silicone Membrane Valve", <u>Proceedings of IEEE 10<sup>th</sup> Annual International Workshop on MicroElectro Mechanical Systems, Sensors and Actuators</u> , A64(1):101-108 (1998).	
	DO	Yang et al., "A MEMS Thermopneumatic silicone Membrane Valve," <u>Proceedings of the IEEE 10th Annual Workshop of Micro Electro Mechanical Systems Workshop (MEMS '97)</u> , held 1/26-30/97 in Nagoya, Japan, pages 114-118 (1997).	
	DP	Yazdi et al., "Micromachined Inertial Sensors," <u>Proceedings of IEEE</u> , 86(8):1640-1659 (1998).	
	DQ	Young et al., "Contoured elastic-membrane microvalves for microfluidic network integration," <u>J. Biomechanical Engineering</u> , 121:2-6 (1999).	
	DR	Zengerle et al., "A Micro Membrane Pump with Electrostatic Actuation," <u>1992 IEEE Conf. on Micro Electro Mechanical Systems</u> , held 2/4-7/92 in Travemunde Germany, pgs. 19-24.	
	DS	Zengerle et al., "Performance Simulation of Microminiaturized Membrane Pumps," from 7th International Conference on Solid-State Sensors and Actuators held 6/7-10/93 in Yokohama Japan, pages 106-109.	

Examiner Signature		Date Considered	4/1/02
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## INFORMATION DISCLOSURE STATEMENT BY APPLICANT

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Sheet 1 of 1

### Complete if Known

Application Number	09/887,997
Filing Date	Jun 22, 2001
First Named Inventor	Quake
Group Art Unit	1725
Examiner Name	Unassigned
Attorney Docket Number	20174C-004900US

### U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No. <sup>1</sup>	U.S. Patent Document		Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD-YYYY	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number	Kind Code <sup>2</sup> (if known)			
M	AA	5,932,799		Molcs	08-03-1999	
	AB	5,775,371		Pan et al.	07-07-1998	
	AC	5,642,015		Whitehead et al.	06-24-1997	
	AD	5,593,130		Hansson et al.	01-14-1997	
	AE	5,290,240		Horres, Jr.	03-01-1994	
	AF	4,898,582		Faste	02-06-1990	

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### FOREIGN PATENT DOCUMENTS

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		Office <sup>3</sup>	Number <sup>4</sup>	Kind Code <sup>5</sup> (if known)				

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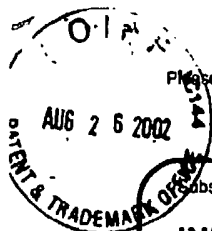
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<sup>1</sup> Unique citation designation number. <sup>2</sup> See attached Kinds of U.S. Patent Documents. <sup>3</sup> Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). <sup>4</sup> For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. <sup>5</sup> Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. <sup>6</sup> Applicant is to place a check mark here if English language Translation is attached.

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Sheet

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Applicati n Number	09/887,997
Filing Dat	June 22, 2001
First Nam d Invent r	Quake
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Attorney Docket Number	20174C-004900US

### OTHER PRIOR ART -- NON PATENT LITERATURE DOCUMENTS

Examiner Initials *	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T <sup>2</sup>
	AA	XP-002149046, Ullmann's Encyclopedia of Industrial Chemistry, Sixth Edition, 1999 Electronic Release, 6 pages.	

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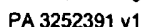
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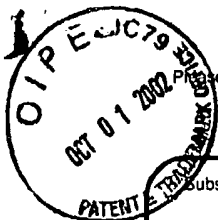
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	AB	Van de Pol et al., "A Thermo-Pneumatic Actuation Principle for A Microminature Pump and Other Micromechanical Devices," <u>Sensors and Actuators</u> , 17:139-143 (1989)	

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A	AA	6,155,282		Zachary et al.	12-05-2000	
	AB	6,043,080		Lipshutz et al.	03-28-2000	
	AC	5,875,817		Carter	03-02-1999	
	AD	5,681,024		Lisec et al.	10-28-1997	
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	AH	4,245,673		Bouteille et al.	01-20-1981	
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	AK	3,570,515		Kinner	03-16-1971	

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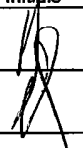
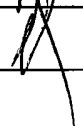
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	AL	Quake et al., "From Micro- to Nanofabrication with Soft Materials," <i>Science</i> , 290:1536-1540 (2000).	
	AM	Unger et al., "Monolithic Microfabricated Valves and Pumps by Multilayer Soft Lithography," <i>Science</i> , 288:113-116 (2000).	

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